Editorial

Carbide quartet

There can have been few historical precedents for the emergence of no less than four SiC-related fabs in one month. Not only is this fairly rare in mainstream manufacturing of semiconductors such as silicon these days, but also in the compounds. Rarer still is the setting up of such facilities for wide bandgap semiconductors such as SiC and GaN. In fact the world's complement of fabs for these challenging materials had likely doubled by the end of August.

As shown in this issue, the month of August had Cree, SemiSouth, II-VI Inc., and Norstel announce their manufacturing plans for WBGS. The interest does not stop there, however. These all have some microelectronics flavour rather than just being for optoelectronics devices – there are quite a few LED facilities worldwide, though these use either SiC or sapphire. But there are few independent substrate suppliers. SiC is finding applications outside opto in high-power, high-speed, high-frequency and other areas of electronics. Collectively these represent a worthwhile market for the companies making the recent announcements.

The four new fabs for the development and manufacture of silicon carbide based microelectronic devices were as follows:

- Cree's newly opened 230,000 sq ft engineering and production facility in Research Triangle Park, North Carolina, became operational and is currently producing advanced electronic devices based on SiC and GaN.
- SemiSouth Laboratories opened a new multi-million dollar, state-of-the-art facility in Starkville, Mississippi, USA.
- II-VI, Inc. now has a SiC wafer processing clean-room which is located inside the SemiSouth facility.
- Norstel, the spin-off from Finland-based silicon specialist Okmetic Oyj, formally opened a new 2,000 sq m SiC wafer facility near Norrköping, Sweden, targeting power electronics.

Moreover, none of these new SiC facilities can be said to fall within the definition of a start-up. In fact, all are part of a well-established company. That is in itself a useful indicator of how and where the investments are currently being made. One exception to restore the balance is Lumileds' new factory plans for Singapore. Likely there will be in due course further start-up companies appearing to exploit SiC.

A measure of the confidence is put this way by Dr Asko Vehanen, CEO of Norstel, who some readers will remember from his many years in GaAs materials: "We are now taking a major step towards establishing Norstel as a significant supplier of SiC materials. Our technology is based on HTCVD. Making this method truly industrial will enable Norstel to produce high-quality, large-diameter SiC crystals and wafers cost-efficiently, thereby opening new markets and applications."

Not only is the technology coming seemingly faster, but also the confidence thus inspired is easing plans for further investment. Indeed, this expansion of available capacity should encourage designers to think about starting up on their own, as well as consideration as a viable alternative in existing or innovative new systems products. There is nothing to beat safety in numbers. In semiconductors there is an innate conservatism, despite appearances to the contrary. Only once there is a reliable, controllable, secure supply of good materials and devices built on them can this part of the business open up.

Roy Szweda, Acting Editor

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